

HORTON (H.L.)

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EFFECT OF ATROPINE
IN
DIMINISHING THE PAINS AND SHORTENING THE DURATION
OF THE
FIRST STAGE OF LABOR.

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HENRY L. HORTON, M.D.

*Reprinted from the AMERICAN JOURNAL OF OBSTETRICS AND DISEASES OF
WOMEN AND CHILDREN, Vol. XI., No. III., July, 1878.*



NEW YORK:
WILLIAM WOOD & CO., 27 GREAT JONES STREET.
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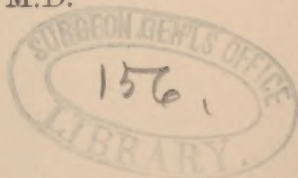
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BY
HENRY L. HORTON, M.D.,
New York.
(With one wood-cut.)



I CONFINE my remarks mainly to a consideration of the first stage of labor, with special reference to the use of atropine during that period—a period trying alike to patient and physician, as all who have had experience in obstetrics can testify. Only within a comparatively recent period have physicians regarded the pain and suffering experienced by the human female during labor otherwise than as a necessary accompaniment of that process, and, as a consequence, they formerly abstained from any interference with it, either medically or mechanically, except in very rare cases. Even in such cases, assistance was not rendered, in many instances, until the system had given strong evidences of its inability to perform the allotted task, and had manifested unmistakable symptoms of danger—in short, had given every proof of its powerlessness to bring about relief unaided. That it may not be thought I am using language stronger than the facts warrant, I refer to a few authors who were for many years considered the most eminent authorities in obstetrics, also to the rules laid down by them, indicating the use of the forceps in the second stage of labor, which may give you some conception of the nature of the assistance they rendered their patients in the first stage.

Dr. Osbourne says, “In the state indicating the use of the forceps, *all the powers of nature are exhausted*, all capacity for further exertion is at an end, and the mind as much depressed as the body; they would both together sink under the influence of such continued and unavailing struggles.”

Dr. Collins did not think it right to interfere as long as the head advances ever so slowly, unless the child be dead.

Dr. Denman enjoins us to wait at least six hours, with the

head of the child stationary in a position favorable for the use of the forceps, before the instrument is applied.

Dr. Gooch would extend this period of suffering to twelve hours.

When such rules were acted on and strictly followed as to the assistance to be rendered during the second stage, what must have been the practice as to the assistance to be rendered in the first?

Dr. Gooch, the author last quoted, in speaking of retarded labor in the first stage, from irregular pains and rigid cervix, uses this remarkable language: "I am tired of giving opium in these cases; my remedy is *tincture of time*, the loss of which is the only thing to be regretted, for it, at least, produces no additional evils. You must keep up the spirits and confidence of the patient and her friends. A female companion who has herself had a half dozen tight labors, and who can tell stories of friends who have been a week in labor and have done well at last, will be a good assistant to you." Yet if we follow him further, we find that he did not trust entirely to this somewhat marvellous tincture, for he says, "In slight cases, where the cervical portion of the uterus is thick, hard, gristly, hot and painful, as if in a state of subacute inflammation, and the dilatation proceeds very slowly, and the os uteri to the touch, instead of conveying the sensation of an orifice in a piece of broadcloth, feels like an orifice in an inch deal board, warm salt-water injections are of great service, relieving, as by fomentation, the sub-inflammatory state of the cervix uteri."

Dr. Byford, writing as late as 1870, says: "If we wait, it will be overcome by the pressure of the uterine contractions generally, and as it is to be overcome by *force alone*, we are justified in greatly aiding the uterus with the fingers; the fingers may be introduced, and the anterior lip of the os pressed up towards the symphysis pubis, and retained in that position, while the uterus affects the posterior part of the cervix."

Now, I do not object to this manual assistance in such cases, but do object to the time which he selects for rendering such assistance, viz.: during the uterine effort, when the cervical fibres are in a state of extreme tonic contraction. I hold that it should be rendered at a time when the whole uterus is

in a state of repose. Would the surgeon, if about to reduce a dislocated limb, select a time when all the muscles connected with the structure of the dislocated joint were in a state of tonic contraction?

Dr. Leishman, in his *System of Midwifery*, published in 1875, referring to the first stage of labor, says: "Even in cases when its duration is prolonged far beyond the average, this, of itself, is no excuse for interference, unless the general symptoms indicate that it is our duty to accelerate the labor by such means as are within our reach—a state of matters which is of rare occurrence."

I am persuaded that the belief that the pangs of labor are simply manifestations of a perfectly normal physiological process in which art has no right to interfere, prompted Dr. Blundell to make use of the expression, "meddlesome midwifery is bad midwifery,"—an expression that yet finds a place in many of our text-books on obstetrics—and which expression, in my humble opinion, has served as a shield for no inconsiderable amount of timidity and incompetency, and condemned many a sufferer to long hours of the most severe and needless torture. I say needless, because I believe that a large proportion of it can be relieved, and that it is clearly within the province of medicine to effect such relief. In speaking thus strongly, I would not have you infer that I do not respect the authorities in this department; on the contrary, I yield to no man in my respect for them. True, I do not look upon their opinions as being so many hempen cords to bind me, but rather as so many silken threads to indicate to me the route travelled by others along the many winding labyrinths of the science of medicine. For the history of this science furnishes us with numerous instances of the most lamentable results of a blind subservience to authority—a subservience resembling nothing so much as the abject docility of a sightless horse in his measured tread along the beaten track around a bark mill.

I claim that it is the duty of the obstetrician to alleviate and shorten, if possible, the pains of labor, at whatever stage it may be; provided always that he can do so with perfect safety to both mother and child. I hold also that an intelligent interference, if you choose to call it such—I prefer to call it intelligent assistance—is not *meddling* with labor by

any means. Meddling means, when applied to the subject under consideration, an interference with the process of labor when it is all right and needs only to be left to itself, or, in other words, meddling with labor is the being officiously intrusive upon its efforts or operations at a time when it is doing its own work well, and is giving strong proof that it is fully able to accomplish its own task within a period of time that will guarantee, not only the delivery of a living child from a living mother, but also that the child will be in a condition to live, and that the mother will be uninjured as well as alive. For the obstetrician to interfere with the harmonious action of these natural forces, in a natural labor, where he should, as it were, stand only in amazement at the grand triumphs often achieved by these unaided and irrational powers, is simply to be stepping beyond his legitimate province. No one, in such instances, would be justified in resorting to other than the expectant treatment. But, in a given case of labor, though it has terminated favorably, in a given time and with a given amount of pain, yet could a better or more skilful management have effected the same favorable result with one pang less, or one long moment of suffering avoided, then the attendant is responsible for that useless pain, that additional moment of torture. The great diversity of opinion on the question of rendering assistance in the first stage of labor, as well as on the question of the application of the forceps in the second stage, arises from the fact that there is a boundary line between the physiological and pathological territories, and this line varies so much in its course between these different domains that, to a certain extent, its location must long remain in dispute. It is with reference to the neutral ground, as it were, along this line, that authorities differ so widely. In my judgment, questions of this nature cannot be set at rest by any arbitrary rule: they must be determined by the physician himself in and for each individual case, taking all the facts before him.

One high in authority in the past holds strongly to the doctrine of non-interference in the first stage of labor, and characterizes all such efforts as are herein alluded to, as "meddlesome interference," and as pernicious practice. It is to be presumed, however, that where there were strongly marked

pathological conditions, such as a pathological or anatomical rigidity of the cervix, he would sanction even an incision of that structure; yet that would modify to but a limited extent the position which he takes on the side of non-interference. He could not have sat hour after hour at the bedside of a patient writhing under the pangs of labor in the first stage, with the expulsive and resisting forces in fierce conflict—the advantage now with the one, now with the other, but, on the average, in favor of the latter—without having his early impressions of the exquisite arrangements of nature for the accomplishment of certain ends, and her marvellous adaptation to almost every emergency, rudely shocked at times. All of us, I believe, have the same exalted estimate of nature's wonderful mechanism, and are frequently astonished at her workings in the process of natural parturition; yet occasionally we see her battling with conditions which, unaided, she is totally unable to overcome, as, for instance, when she is met, at the outset, by an obstinately rebellious cervix. Who of us, under such circumstances, has not been thankful that the science of medicine has placed at our disposal both the medicinal and mechanical means to teach her prudence at least, if not a lesson?

Having thus briefly, and it may be, too strongly, stated some of my views in reference to rendering assistance in labor, I will, for a moment, call attention to the anatomy and physiology of its first stage. This is said to commence with the beginning of the regular uterine efforts, and to end with the complete dilatation of the cervix. Yet there is another and antecedent stage which has been called by some writers the painless or insensible stage of labor, in contradistinction to the painful or sensible stage that is soon to follow. This usually painless stage commences from eight to fourteen days prior to the beginning of what we call the first stage. A description of this preparatory stage is best given in the language of Cazeaux: "In the last fortnight the internal orifice softens, and yields to distention, then expands from above, so that the upper half of the neck gradually becomes confounded with the cavity of the body: the lower part of the ovum will, evidently, engage in the dilated portion, and soon comes in contact with the parts in the neighborhood of the external

orifice. This contact occasions a progressive irritation of the nerve-fibres of the lower half of the cervix, which, by reacting upon the body, excites its contractions, until finally, the entire neck being effaced, the irritation reaches its maximum, and labor commences."

The phenomena manifested in the first stage of labor relate almost wholly to the obliteration of the external os, and its distention to such a degree as to admit of the passage of the fetus from the cavity of the uterus above into the vagina below. The sufferings experienced by the female during this stage are of a marked and peculiar character, and are borne by her with less patience and much less fortitude than those of the second stage. She seems instinctively to dread the former, for the reason, I presume, that she imagines she is not accomplishing any desired results, or getting any nearer her final delivery. Those of you who have watched closely the cries and movements of a female in labor, will probably remember that, while the first stage impressed you particularly as one of pain and suffering, the second gave you as strong an impression that it was one of exertion and work. You will also remember that any attempt at an examination during the first stage is, in the majority of cases, productive of additional suffering from which the patient shrinks, and that she pleads for something to relieve her of what she considers needless pain.

I believe that it is a well-known fact that there is a marked difference in the amount of pain endured during parturition, between individuals belonging to savage tribes, and those belonging to the civilized races, and that this difference becomes more apparent if we select for our comparison the more highly civilized among the latter. In the latter we find not only much less muscular power, in the uterus as well as in other parts, but we also have to deal with systems which, by means of false habits of life, are less adapted to endure pain. And it is not alone the results of these false habits with which the obstetrician has to contend. One other element, which frequently taxes the resources of his art to the utmost, is the mental condition which is often the legitimate attendant upon the leading of a so-called fashionable life. The dilatation of the cervix is not simply a mechanical stretching, brought about

wholly by the action of the longitudinal fibres of the uterus acting on and over the inclosed fetus, the presenting parts of which they are mechanically forcing through the circular fibres of the cervix, but there is also a physiological process taking place, especially in all perfectly normal and easy labors. This process consists in a general infiltration of a serous fluid into its muscular structure, softening and separating its fibres to such a degree as to make them pliable and easily distensible by only a fair amount of effort on the part of the longitudinal fibres. Now it may be easily conceived how a weak muscular tone, such as that which frequently obtains under a high state of civilization, together with a nervous system sensitive to pain by so much the more as the mental condition lacks will force, would present us with a case departing widely from the normal type of labor. Nor is it all surprising that, under such conditions, we have to encounter a rigidity of the cervix of the spastic variety which, by the way, I believe to be far more frequent than the two other varieties combined. This variety I regard as arising particularly from an excessively sensitive condition of the inner walls of the cervix, producing such an intense degree of pain as to embarrass greatly the strong rhythmical action of the expelling fibres, and which condition, if left to itself, must inevitably condemn the patient to suffer on, until the resisting force slowly succumbs to the expelling, and allows the labor to pass on to the second stage.

Some two years ago, I had under my care a patient suffering from a most severe form of prolapsus ani, which had resisted all the usual treatment. Her condition, at the time she came under my charge, was pitiable indeed. She was obliged to remain constantly in a recumbent position, and even in this position the bowels did not always remain in place. After trying a few astringents, anodynes, etc., without avail, I injected, hypodermically, one-sixtieth of a grain of strychnia into the structure of the sphincter ani. This, followed daily for about two weeks, so far relieved her that she has not since been troubled with the distressing malady to any considerable extent.

Strychnia having acted so well as a tonic agent to that muscle, I decided to try atropine upon the same muscle, where an antispastic effect was the object to be attained, and for this

purpose selected a case of swollen strangulated hemorrhoids occurring after parturition. The use of it in the afore-mentioned condition was so satisfactory that I now always resort to it in severe cases of that nature. The hypodermic use of atropine having resulted so favorably in relieving the spasmodic action of the sphincter ani, I determined to try an injection of it into the substance of the cervix during the first stage of labor, when labor was delayed in consequence of a rigidity of that structure, of the spastic variety.

The first step towards carrying my design into effect, was to procure a suitable syringe and needle. This, which is shown



herewith, I had made, and for it I am indebted to the skill of Messrs. Otto & Sons, of New York City.

CASE I.—The first case in which I had an opportunity to make practical application was that of Mrs. O—, primipara, aged 42. Saw her first in the afternoon of November 18th, 1877. From the marked irregularity of the pains, both in frequency and force, I diagnosed what are termed “false pains,” and accordingly gave morphia—learned the next morning that she had passed a moderately comfortable night, though not entirely free from pain. An examination at this time disclosed a hard, undilated, and apparently unyielding os—ordered more morphia, but when I left was not without some misgivings as to the future of the case. Early in the evening of same day visited the patient again, and found her about the same as when I left, excepting that the pains had now become somewhat more regular in their occurrence, and of greater duration and force. An examination showed that the os was still but little disposed to relax its grasp in front of the vertex of the fetus, which could be felt pressing firmly against its inner surface. Now, that I might possibly assist the uterus in its task, I injected into the structure of the cervix, by the needle, about one-fiftieth of a grain of atropine. I proceeded as follows: After hooking the anterior lip of the cervix with the index finger of the right hand, and drawing it slightly forwards, I carried the needle along the palmar surface, keeping the point pressed quite firmly against it, so as to avoid wounding the maternal parts. After carrying its point well within the cervix, I raised it from the finger, and, by a slight traction, buried it somewhat deeply into the muscular structure of that portion of the uterus. After discharging its contents, I retained it in that position a few moments, in order that the absorption of the atropine might be certain to take place, as, without

taking such precaution, I should not have been certain but that it was washed away by the flowing of the blood caused by the puncture of the needle. Having patients in the immediate neighborhood, and supposing I should have ample time, I visited them, but was surprised, on my return after an absence of only ninety minutes, to find the child not only born, but washed as well. After giving the patient one drachm of fluid extract of ergot, I removed the placenta without difficulty, and without the slightest evidence of uterine inertia or hemorrhage. The child was probably a little below the average in weight, but well, and showed no symptoms of having been affected by the belladonna.

CASE II.—Mrs. S——, aged 33, sixth child. The history of this case is, in short, one of placenta prævia. A diagnosis had been made three months previous, since which time she had had repeated, but not very alarming, hemorrhages. Because of there being no hemorrhage, and it being night-time, it was eight hours subsequent to the commencement of labor pains before I was summoned. She thought that, as these pains were not, at first, any more severe than others she had experienced in the course of the preceding months, they would probably pass away, as those had done, or that, at least, she could wait until morning. At the time of my visit, which was November 20th, 1877, the uterine efforts were feeble, but occurred at regular intervals. An examination showed that the os was dilated to about one and a half inches in diameter, but evinced no great tendency to yield to the weak efforts made by the uterus. The margin of the placenta could be distinctly felt on the right side of the uterus, but was high enough up to lead me to expect a favorable result. I now injected into the substance of the cervix one fortieth of a grain of atropine, then at once ruptured the membranes, and applied a moderately tight bandage in order to hold firmly and continuously the vertex of the fetus against the inner wall of the cervix, and lessen as much as possible the risk from hemorrhage, which might occur at any moment during the process of dilatation of the cervix. About four strong efforts of the uterus now followed in rather quick succession, during the last of which the os appeared to offer no further resistance, and the head of the child cleared it at once, and settled into the excavation. One drachm of ergot was now given, and the uterus was firmly compressed by the hand during its succeeding efforts, at the third of which a full-sized and healthy child was expelled. The uterus, still under the pressure of the hand, in a few moments surrendered its misplaced placenta. This was followed by only a moderate hemorrhage. I found the patient next morning with the pupils dilated, and complaining of a dry throat and dimness of vision, which, I assured her, would speedily disappear.

CASE III.—Mrs. E. M., aged 24; primipara. Saw her first Dec. 15th, 1877, at 10.30 A.M.; learned that she had been in more or less pain for eight and a half hours. The pains, at that time, had a periodicity of about eight minutes. An examination showed that the os would readily admit the entrance of the index finger between

each of the efforts, but that, during an effort, it became hard and resisted its introduction. It was plainly a case of spastic rigidity of the cervix. Three hours after, although it had yielded a little, it still retained enough of its spastic character to lead me to expect a long and tedious first stage, at least. After waiting two hours more, there being no very marked change in the condition of the cervix, and the patient being pretty thoroughly wearied with her thirteen and a half hours of pain, I injected one-fortieth of a grain of atropine. Returning in forty minutes from another call, I found that the os had lost its spastic condition, also that the uterine effort was much greater. I now ruptured the membranes, after which I was able to diagnose the position of the vertex, which was that of R. O. A. From this time the labor progressed so rapidly, that a healthy female child was born in ninety-five minutes.

One drachm of ergot was then given, and placenta removed. No symptoms of uterine inertia appeared.

CASE IV.—Mrs. C. H., aged 21, primipara, taken with labor pains at 1.30 A.M., Dec. 22d, 1877. Saw her at 8 A.M.; pains were short, sharp, and recurring at rather long intervals. Examination disclosed that the os would readily admit the point of the finger during repose of the uterus, but that, while the latter was in its active stage, it seemingly partook of the general contraction going on within the body of that organ, and then at once became firm and unyielding. At ten o'clock, dilatation had taken place to the extent of about one inch in diameter, but there was still rigidity during each uterine effort. Judging that the os was offering too great resistance for the weak efforts of the uterus to overcome in a reasonable time, I injected $\frac{1}{40}$ of a grain of atropine. In twenty minutes, the pain had become much greater in force, and in ten minutes more, dilatation was so far complete as to warrant me in rupturing the membranes. This gave exit to only a small amount of fluid. The head, which was found to be in the R. O. I. position, slowly engaged in the superior strait, and reached the cavity of the sacrum at about 12 M. I now gave, though somewhat reluctantly, one-half teaspoonful of ergot, which did not, however, produce any appreciable effect. At 1 P.M., the head was slowly approaching the inferior strait, with the pain lessening in force. The patient being weary, begged me to relieve her, to which reasonable request I assented; but, not wishing to evoke a power which I could not control, I applied the forceps instead of giving ergot. In fifteen minutes, a strong and healthy child claimed our companionship. I could not discover that the pupils of the child were in the least disturbed by the atropine, though the mother, for a time, complained of a dry throat and dimness of vision.

CASE V.—Mrs. L. M., aged 27, primipara. With the exception of occasional attacks of neuralgia, she had always enjoyed good health. Was called to see her in the afternoon of January 12th, 1878. According to a previous calculation of mine, she yet lacked twenty-eight days of being at full term. Found her suffering considerably from pain which I diagnosed as neuralgia, and gave mor-

phia. A digital examination of the cervix showed that there was a strong probability that my calculation as to her time was erroneous, and that she was then near her full period, and that the pains of labor would shortly claim her attention instead of the neuralgia from which she was then suffering. As she had not slept for about twenty-four hours, I prescribed $\frac{1}{12}$ grain of morphia, combined with three drops of tincture of gelsemium—the latter to obviate the nausea that, at times, follows the use of an opiate—the dose to be repeated hourly, until she was relieved. She passed a moderately comfortable night, and by next morning was entirely free from pain. At eleven o'clock that evening, I saw her, pursuant to a summons, and learned that, at 5 o'clock that afternoon, the waters came away, unattended by any positive pain, however; also, that she did not have any pain until nine o'clock, at which time well-marked labor pains commenced. An examination showed that the os was hard, unyielding, and undilated, and its rim almost cord-like during the action of the uterus. I soon ascertained that there was a considerable quantity of amniotic fluid yet to escape. During the repose of the uterus, at which time the os was most pliable, I cautiously elevated the head of the child, and allowed the water slowly to escape: being careful, however, not to elevate the head so far as to allow a loop of the cord to slip under it. At fifteen minutes past eleven, I injected $\frac{1}{40}$ of a grain of atropine into the tissue of the cervix. In a few moments, the pains increased in force and duration. In forty-five minutes, dilatation was complete, the head cleared the cervix, and engaged in the superior strait, then slowly descended into the excavation. The patient now became very nervous, and, knowing that she could be relieved by the forceps, begged me to apply them. This I did, and by a very slight traction during each pain, the head soon rested upon the perineum, and began to distend the vulva, at which point, as is my invariable custom, I removed the instrument. In a few minutes, the child was born, and in just one hour and forty-five minutes from the time I injected the atropine. The child cried lustily, and manifested not the least symptoms of having been in such close proximity to a part which had had injected into it a maximum dose of atropine. The mother complained of a dry throat, and the pupils were dilated. Slight hallucinations continued for about a day.

CASE VI.—Mrs. W., aged 22, primipara. Below the average in stature, but well formed. Saw her Jan. 21st, 1878, at 10 A.M. She had been in labor twelve hours, during the last four of which it had been quite severe. An examination disclosed that the os was dilated to the diameter of just one and a quarter inches, and had a hard, cord-like rim during each pain, which was only moderate in force. I at once injected $\frac{1}{40}$ of a grain of atropine, which, in this case also, had the effect apparently to increase the force of the uterus, and also to so thoroughly and efficiently overcome the spastic action of the circular fibres that full dilatation was accomplished in forty minutes. I then ruptured the membranes and diagnosed an L. O. L. position of the vertex, which slowly descended into the excav-

ation. Being quite satisfied that nature, if unaided, would prove unable to complete the labor within a limit of time which would be safe for both mother and child, I applied the forceps, and brought the head to the inferior strait, from which point nature completed the delivery. Mother and child both did well, and neither manifested any symptoms of having absorbed any atropine.

CASE VII.—Mrs. J. A., aged 36; tall, thin, pale, and delicate. Had suffered for six years from occasional attacks of asthma of the most severe form, for the relief of which she had sought every known remedy, including continental travel; had one labor previous to the present one, which occurred twelve years before, at which time she came very near losing her life from post-partum hemorrhage. About the period when the asthma commenced, I found there was a retroversion and descent of the uterus, which added much to her general distress, until relieved by a properly adjusted soft-rubber pessary. Two years ago last winter, she came near dying from double pneumonia, from the shock of which she did not fully recover until the present pregnancy began, the influence of which upon her system was such as to effect almost a renewal of life. From certain circumstances attending this case, it could be definitely ascertained that the conception could not have occurred after the 25th day of June, 1877: consequently, the period of gestation was protracted ten days beyond the usual period, delivery having taken place on the 10th day of April, 1878. For two weeks prior to the 280th day, she suffered from pressure much more than is usual. On the evening of April 7th, her husband called and stated that she was losing the cheerfulness and hopefulness which she had always exhibited in a marked degree during illness, and was giving way to despondency and forebodings. I told him I had no doubt this was caused by the fact that the pregnancy had exceeded the allotted period, and that the only reason I could assign for such excess was that the uterus had become distended beyond its contractile power, and that about the only thing which could be done was to assist the uterus in its feeble efforts. At 12 m., on the 8th of April, on examination, I found the uterus, or rather the cervical portion of it, the same as it had been for several days, to wit: the os firmly closed by a rather hard and unyielding rim that would not permit even the point of the index-finger to pass. The internal os was wholly obliterated, as the vertex of the child could be felt lying firmly pressed against the internal surface of the external os. I now injected one fortieth of a grain of atropine into the structure of the cervix, but with considerable difficulty, on account of the os being so firmly closed, which prevented me from performing the operation with the precision I desired. Saw the patient two and a half hours after; found the os so much less resistant that it required but slight force to pass the index-finger: there was no uterine effort. At 6 p.m., the os being about as at the previous call, I injected, this time easily, $\frac{1}{4}$ of a grain of atropine. At the same time, using the needle as a tenaculum, I drew the os, which was still moderately high up, downwards and forwards, and

held it in that position by the needle, while with the index finger I swept around the inner surface of the cervix, between it and the membranes, freeing the latter from the former, as high up as possible to reach. At 10 p.m., found the pupils markedly dilated, and the patient complaining of a very dry throat; the os admitted two fingers readily; the membranes were still intact. The position of the vertex could now be determined, which was R. O. I. No effort at contraction was manifested by the uterus. My first suspicion as to the cause of delay in this case was now shown to be a certainty, namely, that it was due to a too wide distention of the uterine walls. Feeling that still further delay could, at most, only result in the loss of a little more of Dr. Gooch's "tincture of time," I decided to wait until morning, at least. At 10 a.m. of the 9th, I found the os quite easily dilatable, but with no effort, as yet, on the part of the uterus. At 8 p.m., there was no change, except that the os was still more soft and dilatable, with an occasional slight uterine effort. As the patient was not suffering so much as to prevent her from obtaining a reasonable amount of sleep, and as I was myself greatly in need of the "chief nourisher in life's feast," I decided to leave the membranes as they were, and wait again until morning. I was, however, sent for, and saw the patient again at 3 a.m., April 10th, just thirty-nine hours after the first injection. I learned that affairs remained unchanged until midnight, but at that time the pressure had begun to increase, and had continued so to do, moderately, up to the time of my call. The reason the patient gave for not sending for me before was that she had been waiting for pains to come on. A examination showed the condition to be about the same, excepting that the uterus was now making regular and well-marked efforts, during which the membranes were tense, but manifested not in the slightest the form of a "dilating wedge." Seizing an opportunity, at the close of one of these efforts, I ruptured the membranes, and relieved the uterus of the greater portion of its amniotic contents. From this time onwards, the labor progressed actively, and, in fact, about the only obstacle it encountered was from the great elongation of the cervix, the tissue of which seemed to be hardly sufficient in quantity to permit its distending to such extent as would allow the child to pass. The child proved to be a male, weighing $8\frac{3}{4}$ pounds. At no time was there any of that sharp, cervical pain which adds so greatly to the suffering of a patient, although the cervix was so thinned that it was like a piece of parchment to the touch. Soon, however, the head cleared and descended to the floor of the pelvis. I now gave one drachm of fluid ergot, to guard against a repetition of what occurred in her former labor. In a few moments after, at 4.45 a.m., the child was born. There was no uterine inertia, and the child was not in the least affected by the atropine.

The following case, though not strictly illustrative of the topic of this essay, inasmuch as it is an instance of the so-called hour-glass contraction occurring during the second stage

of labor, is yet entitled to insertion by reason of its close approximation to the foregoing cases, both in its nature and the means adopted for relief. So far as my examination shows, none of the systematic treatises on obstetrics satisfactorily discuss cases of this kind, and the young practitioner might long remain in ignorance of complications of this nature, which, as I believe, are of much more frequent occurrence than is supposed, and which are not seldom incorrectly diagnosed:

CASE VIII.—Mrs. G. H., aged 27, third labor. Was called to see her at 9 p.m., April 27th, 1878; both her previous labors were much less painful and shorter than the average; learned that she had been in pain since 12 m., but that during the past two hours only had it been strongly marked. The action of the uterus differed from a perfectly normal action in respect only that its efforts were short and sharp, and the intervals of repose were irregular in duration. The efforts were abrupt, reaching their highest pitch of intensity at once, and subsiding as quickly. An examination showed that there was a most profuse, glairy discharge, that the os was high up and dilated to about two inches, and freely dilatable. The patient had passed one month beyond her own reckoning, and, as is usual, had become nervous about herself, and to this nervousness I attribute the apparently slight deviation in the action of the uterus from the normal type, above referred to, and supposed this would be rectified as soon as the labor had gotten fully under way. I therefore ruptured the membranes and allowed the vertex to impinge upon the inner surface of the cervix. I was confident that the labor would prove to be short and easy, and unqualifiedly, though perhaps unwisely, expressed that opinion, but I was doomed to disappointment. Notwithstanding the apparently strong efforts of the uterus, the roomy nature of the pelvis, the copious discharge, the non-resistance of the cervix, and the favorable position of the presenting part, it being R. O. L., the labor did not progress, the head did not enter well within the pelvic brim and remain there. So far as I could ascertain, the muscles of the uterus were acting with reasonable energy and a fair amount of co-ordination, although I was hindered somewhat in my examination by the great quantity of adipose tissue contained in the structure of the abdominal parietes; but notwithstanding these favorable conditions and numerous changes of position and form and persistent pressure over the fundus of the uterus in the direction of the axes of the superior strait, the labor remained the same until about 2 p.m. I was now convinced that some unusual cause, other than the slight irregularity above mentioned, retarded delivery. I accordingly passed my hand into the vagina and grasped the head, which, on examination, I found to be freely movable circularly around the pelvic brim during the repose of the uterus, as if attached by an ordinary swivel hook. Watching my opportunity, I gently passed the fingers along over

the globe of the head, and between it and the anterior wall of the cervix uteri, and carried them fully up to the neck of the child, where I found a circular uterine band, so firm to the touch that it resembled nothing so much as the unyielding cervix so often met with at the beginning of labor. The entire body of the child, except the head and a small portion of the neck, lay wholly beyond this tetanically contracted ring at the lower segment of the uterus, and which was, without a doubt, composed wholly of the tissue of the uterus of that point. The posterior lip of the cervix was so infiltrated with serum as to be greatly thickened and elongated, and it hung pendulous in the vagina. The anterior lip was in a similar condition, but only to a limited extent. Knowing that delay would only aggravate the case, and cause no inconsiderable danger to mother and child—to the mother from exhaustion, inflammation, and further infiltration and probable sloughing of the cervix, and to the child from compression—I injected into the anterior lip of the cervix $\frac{1}{4}$ of a grain of atropine, combined with $\frac{1}{4}$ of a grain of morphine. Probably, under the conditions, if a more distant point had been selected for the injection, it would have answered the purpose as well. The only thing worthy of note at first was the length of time which elapsed before the compound took effect. This I attributed to the almost pathological condition of the structure into which the injection was made. In about one hour, however, the patient gave evidence of its operation. There was dryness of the throat, dizziness, an almost complete subsidence of effort on the part of the uterus, and tendency to sleep. This latter, however, I attributed rather to exhaustion. On another examination now made, in the same manner as the former, I found there was a total absence of the constricting circular band. On the contrary, the uterine cavity and vagina together formed one continuous canal, at the upper or blind extremity of which the child was closely packed. I introduced my short forceps, turned the patient upon her left side and firmly flexed the thighs, after which I seated myself in a position somewhat facing the perineum, and properly adjusted and locked the forceps in the fronto-mastoid diameter. After giving a full dose of ergot, and gently kneading the fundus uteri for a short time, a moderate expulsive force was manifested, which I aided by moderate and persistent tractile force upon the forceps, which did not amount to what might be called pulling. This caused the head to rest upon and distend the perineum in a short time, at which point that valuable auxiliary to labor, reflex action, came to my assistance, and before I could remove the second blade of the instrument, a large and healthy male child was born. Both mother and child did well.

From the cases just stated, we must necessarily draw one of two conclusions—either, first, that the atropine had a most markedly beneficial effect, or, second, that they were just so many cases of coincidences. I have said nothing, as may have been noticed, about other forms of rigidity; namely, the

pathological and anatomical. This is for the reason that I have not as yet had opportunity to apply this treatment in such cases.

In the former variety, I cannot conceive how the treatment herein described could be of any service, except that it might deaden that sharp, cutting pain which necessarily accompanies such a condition, and which, if unrelieved, produces the same effect as is observed in a case of spastic rigidity; that is, it embarrasses the efforts of the uterus so much as to render its expulsive force nearly or quite unavailing. In the anatomical variety it might be of service by acting on and relieving any spastic element which might be present as a concomitant.

It is claimed by some writers that a rigidity of the cervix will generally be found attendant upon an insufficient uterine force, and a consequence of it. My own impression is, that this is an error, and that a more reasonable supposition is, that the cervix becomes spastically rigid, because inordinately sensitive to the pressure within, which pressure causes pain so acute as to shock the entire nervous system to such a degree that the expulsive force of the uterus is greatly embarrassed, and that thus weak pains are found to result, indirectly, from an over-sensitive cervix. If this be so, it is obvious that, if we subdue the irritability of that structure, and lessen that severe pain which embarrasses the action of the uterus at this stage of labor as quickly and effectually as a severe cramp in the limb would interfere with the second stage of labor, we shall then restore the equilibrium of the nervous system, and the nervous force will become properly distributed; the spastic rigidity will disappear, and the body of the uterus will act at suitable intervals of time, and with a due degree of force.

This oversensitive condition of the cervix, under such circumstances, appears to be a wise provision of nature; for let us suppose that the expulsive force was not in the least affected by this sensitive condition of the cervix, and should drive the fetus through it regardless of its spastic character? How many more than at present should we have of cases where the thin and delicate lining of the cervix would be lacerated to such an extent as to cause the latter to be hypertrophied, raw, and angry, and remain pouting through a torn and ragged os—a condition in which it might remain for months, or even years,

and which, if unrelieved, would condemn the sufferer to lifelong invalidism.

Let us suppose that, in a given case of labor, the expulsive force is twenty pounds, and the resisting force precisely the same. It would not require that the physician should be endowed with any great amount of prevision to enable him to foretell what the result would be, so long as these forces continued in the same relative proportion. It certainly would not be good practice for him to seek to augment the expelling power, if sound judgment would sanction an effort to lessen the resisting power. It is obvious that, if he could succeed in lessening it by ten pounds, it would be equivalent to doubling the expelling force.

I have said nothing about mechanical dilators, and the use of anodynes and anesthetics, for the reason that all are well acquainted with their use, in cases where indicated. There is, however, one other remedy often resorted to in cases of rigidity of the cervix, to which I wish to call attention more particularly. It refers to the hot douche. This, as is well-known, is used to accomplish the same end in case of rigidity in labor at term, as when used to bring on premature labor—that is, to soften and render more or less pliable and distensible the cervical ring. But we also know that, before such a condition can be brought about, more or less fluid of a greater density than water must be effused or infiltrated into its connective tissue, and the muscular fibres of which that structure is so largely constituted must be separated to a certain extent. I think that keeping a structure like that of the cervix for a long time in immediate contact with pure water, at a temperature higher than that of the body, would necessarily set up more or less exosmotic action. If so, the effect would be the reverse of that of pliability and distensibility. To use a strong comparison, it would bring about a condition like that of the washerwoman's fingers, after she has been a whole day at the tubs.

It is stated by many authorities upon obstetrics at the present time, I believe, that even if labor in the first stage be considerably prolonged, no great danger is to be apprehended. This is true only so far as the *immediate* effects upon the mother are concerned; but the exhaustion of muscular con-

tractility during the first stage may be so great, by reason of such prolongation, as to render mechanical assistance absolutely essential for the completion of the second stage. Again, a muscular structure that has been overtaxed, allowing it to have been overtaxed by time and not by force, is, as is generally known, more susceptible to inflammatory action, and, in the case of the uterus, which has to undergo such an important change after parturition, it is found that, in addition to a susceptibility to inflammation, it is not, after unduly prolonged efforts, in a condition favorable for such change.

I have presented herewith the results of my labors towards the attainment of what has been to me a long-sought object, viz., the abbreviation and diminution of the pains of labor in its first stage. How far I have been successful, or how far my suggestions will be found worthy of approval, time and experience will determine.

